
PAO

1
00:00:01,380 --> 00:00:03,950
>> Kyle: We have an
opportunity to be joined here

2
00:00:03,950 --> 00:00:06,220
in the flight control room

3
00:00:06,220 --> 00:00:09,670
by certainly no stranger
to mission control.

4
00:00:09,670 --> 00:00:12,150
Derek Hassman is
a flight director.

5
00:00:12,150 --> 00:00:14,830
He's also working in the
Commercial Crew Program,

6
00:00:14,830 --> 00:00:18,190
and he's just been named
to be the Partner Manager

7
00:00:18,190 --> 00:00:22,060
for SpaceX base exploration
technologies.

8
00:00:22,060 --> 00:00:25,940
And we're real happy to have
Derek stop by the front corner

9
00:00:25,940 --> 00:00:28,890
of the room, instead of back
there at the flight console.

10
00:00:28,890 --> 00:00:30,760
So welcome, Derek,
great to have you hear.

11

00:00:30,760 --> 00:00:32,330
>> Derek Hassman: Thanks,
Kyle, it's good to be back.

12
00:00:32,330 --> 00:00:35,500
>> Kyle: Well, obviously,
most people know you

13
00:00:35,500 --> 00:00:37,320
as a flight director,
but talk a little bit

14
00:00:37,320 --> 00:00:40,210
about your background, how
you got to NASA and got

15
00:00:40,210 --> 00:00:42,050
into this business
in the first place?

16
00:00:42,050 --> 00:00:44,010
>> Derek Hassman: Sure,
you bet, I can do that.

17
00:00:44,010 --> 00:00:47,370
Graduated from the University
of Texas in Austin in 1988.

18
00:00:47,370 --> 00:00:51,120
I worked for a couple years for
General Dynamics in Fort Worth

19
00:00:51,120 --> 00:00:52,440
on the F16 program there.

20
00:00:52,440 --> 00:00:56,330
And then I had an
opportunity to move to Houston,

21
00:00:56,330 --> 00:00:58,770

worked for a NASA
contractor in 1990.

22
00:00:58,770 --> 00:01:03,970
From 1990 to 2000 I was in the
mission operations directorate

23
00:01:03,970 --> 00:01:06,200
as a flight controller for
the International Space

24
00:01:06,200 --> 00:01:07,890
Station Program.

25
00:01:07,890 --> 00:01:12,800
I worked STS88 on the station
side, which was the first ...

26
00:01:12,800 --> 00:01:12,960
>> Kyle: Right.

27
00:01:12,960 --> 00:01:13,030
>> Derek Hassman: ...

28
00:01:13,030 --> 00:01:16,320
mission to deliver U.S.
hardware to the space station.

29
00:01:16,320 --> 00:01:19,720
Then I also worked, I finished
my flight control career

30
00:01:19,720 --> 00:01:21,970
as a flight controller on STS98,

31
00:01:21,970 --> 00:01:24,150
which delivered the
Destiny Laboratory.

32

00:01:24,150 --> 00:01:24,970
>> Kyle: Right, the laboratory.

33
00:01:24,970 --> 00:01:26,770
We've been watching some
of that this morning.

34
00:01:26,770 --> 00:01:27,070
>> Derek Hassman: Right.

35
00:01:27,070 --> 00:01:30,700
And then in 2000 I was
fortunate enough to be selected

36
00:01:30,700 --> 00:01:33,540
as a flight director, and
which is what I've been doing

37
00:01:33,540 --> 00:01:35,390
from 2000 to 2012.

38
00:01:35,390 --> 00:01:39,470
I was a lead flight director on
STS120 which delivered node two,

39
00:01:39,470 --> 00:01:43,910
and then STS134, which delivered
the AMS experiment, the station,

40
00:01:43,910 --> 00:01:47,080
and worked a number of other
shuttle assembly missions

41
00:01:47,080 --> 00:01:51,100
and have worked countless shifts
in this room over the years

42
00:01:51,100 --> 00:01:52,160
between shuttle flights.

43
00:01:52,160 --> 00:01:53,700
>> Kyle: Very familiar
with this room.

44
00:01:53,700 --> 00:01:54,610
>> Derek Hassman: Absolutely.

45
00:01:54,610 --> 00:01:57,700
And then in October of last
year I got the opportunity

46
00:01:57,700 --> 00:01:59,720
to do a rotation or
temporary assignment

47
00:01:59,720 --> 00:02:02,010
in the Commercial Crew Program,

48
00:02:02,010 --> 00:02:06,660
and I guess about six months
ago I volunteered to be a member

49
00:02:06,660 --> 00:02:09,790
of the Evaluation Board that
was evaluating the proposals

50
00:02:09,790 --> 00:02:12,290
that were submitted by
the commercial providers

51
00:02:12,290 --> 00:02:15,020
for the CCiCap effort.

52
00:02:15,020 --> 00:02:15,230
>> Kyle: Right.

53
00:02:15,230 --> 00:02:17,140
>> Derek Hassman: So I wrapped
that up, and came back -

54
00:02:17,140 --> 00:02:19,910
that effort was actually at KSC,
so I spent about three months

55
00:02:19,910 --> 00:02:22,990
out at KSC doing the proposal
review and then came back

56
00:02:22,990 --> 00:02:25,950
to Houston, was offered
the job of Partner Manager,

57
00:02:25,950 --> 00:02:29,260
which I'm very excited
about and I accepted.

58
00:02:29,260 --> 00:02:31,630
>> Kyle: Well, which
leads us to, obviously,

59
00:02:31,630 --> 00:02:35,790
to your current role with - as
the Partner Manager with SpaceX.

60
00:02:35,790 --> 00:02:38,170
How familiar, obviously,
with all the proposal work

61
00:02:38,170 --> 00:02:41,190
that you did, you're very
familiar with what's going on,

62
00:02:41,190 --> 00:02:44,760
but how familiar are
you anyhow with SpaceX?

63
00:02:44,760 --> 00:02:47,040
You probably already
had some early meetings

64
00:02:47,040 --> 00:02:48,510
with those folks, right?

65
00:02:48,510 --> 00:02:49,810
>> Derek Hassman: Yes,
as a matter of fact,

66
00:02:49,810 --> 00:02:53,160
when I was in the flight
director office from 2008

67
00:02:53,160 --> 00:02:56,130
to 2009 I was involved in
some of the early planning

68
00:02:56,130 --> 00:02:58,210
that we were doing for
the cargo missions ...

69
00:02:58,210 --> 00:02:58,610
>> Kyle: Oh, right, right.

70
00:02:58,610 --> 00:02:58,680
>> Derek Hassman: ...

71
00:02:58,680 --> 00:02:59,690
that SpaceX is supporting.

72
00:02:59,690 --> 00:03:02,560
I was actually working with
both SpaceX and Orbital,

73
00:03:02,560 --> 00:03:05,180
both of who have - both
of whom have contracts

74
00:03:05,180 --> 00:03:07,470
to do the cargo resupply

to station.

75
00:03:07,470 --> 00:03:10,560
So I worked with SpaceX for
about a year-and-a-half,

76
00:03:10,560 --> 00:03:13,580
prior to this commercial crew
assignment, made a number

77
00:03:13,580 --> 00:03:15,660
of trips out to Hawthorne,
to their facility out there.

78
00:03:15,660 --> 00:03:19,680
So I had relationships with
a number of folks out there,

79
00:03:19,680 --> 00:03:22,750
and understood a lot
about the culture

80
00:03:22,750 --> 00:03:23,860
and the capabilities and such.

81
00:03:23,860 --> 00:03:25,830
So it would - that
helped me in my new role.

82
00:03:25,830 --> 00:03:28,190
>> Kyle: So that transition
had to be pretty smooth then

83
00:03:28,190 --> 00:03:30,720
because you already had
that familiarization

84
00:03:30,720 --> 00:03:33,150
from the flight control
aspect, right?

85
00:03:33,150 --> 00:03:33,410
>> Derek Hassman: Right.

86
00:03:33,410 --> 00:03:36,710
That helped a lot, and then
additionally Garrett Riesman

87
00:03:36,710 --> 00:03:37,670
[assumed spelling] is
their program manager

88
00:03:37,670 --> 00:03:40,820
for their Dragon Writer Program,
SpaceX', and Garrett was,

89
00:03:40,820 --> 00:03:42,280
of course, an astronaut.

90
00:03:42,280 --> 00:03:43,940
So I worked with Garrett
quite a bit in my role

91
00:03:43,940 --> 00:03:47,450
as flight director, so I had a
previous working relationship

92
00:03:47,450 --> 00:03:48,360
with Garrett, as well.

93
00:03:48,360 --> 00:03:51,730
>> Kyle: So you guys,
after this announcement

94
00:03:51,730 --> 00:03:55,330
which came early August,

95
00:03:55,330 --> 00:03:59,470
SpaceX was awarded I

think $440 million ...

96
00:03:59,470 --> 00:03:59,760
>> Derek Hassman:
That's correct.

97
00:03:59,760 --> 00:03:59,830
>> Kyle: ...

98
00:03:59,830 --> 00:04:01,110
as part of CCiCap.

99
00:04:01,110 --> 00:04:01,440
>> Derek Hassman: Correct.

100
00:04:01,440 --> 00:04:05,300
>> Kyle: But you've already
as this new core team talk

101
00:04:05,300 --> 00:04:08,550
about the structure of your
team now and you guys just went

102
00:04:08,550 --> 00:04:10,780
out there, I don't know
if it's a kickoff meeting

103
00:04:10,780 --> 00:04:13,660
or how you describe your
early stage of getting

104
00:04:13,660 --> 00:04:18,000
into the milestone
development for CCiCap?

105
00:04:18,000 --> 00:04:18,770
>> Derek Hassman: Right.

106
00:04:18,770 --> 00:04:22,080

Last week I actually made a
trip out there with my partner,

107
00:04:22,080 --> 00:04:23,710
Integration Team Management.

108
00:04:23,710 --> 00:04:26,480
John Cowert [assumed
spelling] is my deputy

109
00:04:26,480 --> 00:04:29,320
for executing the
CCiCap milestones

110
00:04:29,320 --> 00:04:30,680
or the SpaceX agreement.

111
00:04:30,680 --> 00:04:32,370
Sharon Malloy [assumed
spelling] is my deputy

112
00:04:32,370 --> 00:04:34,930
for the certification
piece of the effort.

113
00:04:34,930 --> 00:04:38,660
So the three of us went
out to SpaceX last week,

114
00:04:38,660 --> 00:04:40,280
sat down with Garrett Riesman.

115
00:04:40,280 --> 00:04:41,540
Met a bunch of the
other employees.

116
00:04:41,540 --> 00:04:44,240
Just talked about strategy
and the road ahead,

117
00:04:44,240 --> 00:04:47,140
talked about the milestones that
we have planned, and just kind

118
00:04:47,140 --> 00:04:49,790
of got reacquainted with
the facility and the people.

119
00:04:49,790 --> 00:04:53,550
And then next week we'll have
our first two milestones.

120
00:04:53,550 --> 00:04:55,880
The first milestone, of
course, is the kickoff meeting

121
00:04:55,880 --> 00:04:59,320
where SpaceX gives
a presentation

122
00:04:59,320 --> 00:05:01,390
on where they are
today, what the status

123
00:05:01,390 --> 00:05:03,830
of their Dragon spacecraft
is, what the status

124
00:05:03,830 --> 00:05:06,100
of their Falcon 9 rocket is.

125
00:05:06,100 --> 00:05:08,080
They'll talk about their
ground systems and,

126
00:05:08,080 --> 00:05:10,600
as well as their
mission control systems.

127

00:05:10,600 --> 00:05:14,130
So just establish a baseline
for where we go from there.

128
00:05:14,130 --> 00:05:16,630
>> Kyle: I think we probably
all know the answer to this,

129
00:05:16,630 --> 00:05:21,870
but how valuable is it that
SpaceX has already been working

130
00:05:21,870 --> 00:05:24,360
on the cargo aspect of this?

131
00:05:24,360 --> 00:05:27,110
It's, certainly they've
even described the Dragon

132
00:05:27,110 --> 00:05:30,110
as in its early development
was really

133
00:05:30,110 --> 00:05:33,650
in their mind they thought
of it as a crew vehicle,

134
00:05:33,650 --> 00:05:36,130
and basically are using
it as a cargo [inaudible]

135
00:05:36,130 --> 00:05:38,580
but they have an
integrated approach.

136
00:05:38,580 --> 00:05:41,010
They have their own rocket,
they have their own spacecraft,

137
00:05:41,010 --> 00:05:44,290

but how valuable is it that
they are already integrated

138
00:05:44,290 --> 00:05:48,140
into the space station program
with the cargo aspect of this?

139
00:05:48,140 --> 00:05:50,050
>> Derek Hassman: It's
a tremendous advantage,

140
00:05:50,050 --> 00:05:53,700
a tremendous benefit
to SpaceX, so to NASA,

141
00:05:53,700 --> 00:05:56,360
because we have the
experience of working with them.

142
00:05:56,360 --> 00:05:59,740
But that has been SpaceX'
stated goal all along,

143
00:05:59,740 --> 00:06:02,800
to eventually fly crew to space,

144
00:06:02,800 --> 00:06:04,900
and they've designed
their rocket

145
00:06:04,900 --> 00:06:06,380
and their spacecraft
to that end.

146
00:06:06,380 --> 00:06:08,700
There's going to be
a significant amount

147
00:06:08,700 --> 00:06:11,680
of modifications and

upgrades that have to happen.

148
00:06:11,680 --> 00:06:12,000
>> Kyle: Right.

149
00:06:12,000 --> 00:06:13,440
>> Derek Hassman: For
example, on the spacecraft,

150
00:06:13,440 --> 00:06:15,450
when they flew the cargo
missions they didn't have an

151
00:06:15,450 --> 00:06:18,160
environmental control
or life support system,

152
00:06:18,160 --> 00:06:20,570
which obviously is required
to support the crew.

153
00:06:20,570 --> 00:06:21,010
>> Kyle: Right.

154
00:06:21,010 --> 00:06:23,910
>> Derek Hassman: And in
general across their spacecraft

155
00:06:23,910 --> 00:06:26,730
and rocket they didn't
necessarily have the amount

156
00:06:26,730 --> 00:06:31,150
of design margin, performance
margin, redundancy that's going

157
00:06:31,150 --> 00:06:33,170
to be required to fly crew.

158

00:06:33,170 --> 00:06:36,690
But the fact that they have
existing hardware that's built

159
00:06:36,690 --> 00:06:39,610
and designed and flight
proven, they've got the systems

160
00:06:39,610 --> 00:06:42,450
on the ground, they've got
trained teams on the ground,

161
00:06:42,450 --> 00:06:44,280
all of that is a
tremendous benefit

162
00:06:44,280 --> 00:06:46,890
for them heading
into the iCap effort.

163
00:06:46,890 --> 00:06:49,030
>> Kyle: You talked
about the structure

164
00:06:49,030 --> 00:06:53,320
and how it's a little - how
is it a little different now

165
00:06:53,320 --> 00:06:56,960
than it was in terms of the
pit team, as they're known,

166
00:06:56,960 --> 00:06:59,360
relative to what it was under
CC Dev 2 [assumed spelling],

167
00:06:59,360 --> 00:07:03,140
which was the previous
Space Act agreement work?

168

00:07:03,140 --> 00:07:05,510
>> Derek Hassman: One of the
key differences between CC Dev 2

169
00:07:05,510 --> 00:07:09,530
and CCiCap is that for iCap we
asked for an integrated system.

170
00:07:09,530 --> 00:07:14,180
So the proposals had to
include a spacecraft, a rocket

171
00:07:14,180 --> 00:07:17,380
or a launch vehicle, as well
as the systems on the ground

172
00:07:17,380 --> 00:07:20,050
to do all the ground
processing leading up to launch

173
00:07:20,050 --> 00:07:22,560
and to do the mission control
function on the ground.

174
00:07:22,560 --> 00:07:27,220
So what we're looking for
an integrated system and,

175
00:07:27,220 --> 00:07:30,700
in addition to that, the
key point of emphasis

176
00:07:30,700 --> 00:07:33,270
or focus during iCap is
going to be certification.

177
00:07:33,270 --> 00:07:37,860
How does the commercial provider
propose to certify their system,

178

00:07:37,860 --> 00:07:40,270
to prove that it's acceptable
and meets all the requirements

179
00:07:40,270 --> 00:07:43,040
for a human rating, to
fly crew into space,

180
00:07:43,040 --> 00:07:46,680
which is obviously a much higher
bar than exists for cargo?

181
00:07:46,680 --> 00:07:47,880
>> Kyle: Right.

182
00:07:47,880 --> 00:07:49,860
>> Derek Hassman: So
in order to support

183
00:07:49,860 --> 00:07:52,740
that we broke-up the
deputy position in the way

184
00:07:52,740 --> 00:07:53,500
that I described earlier.

185
00:07:53,500 --> 00:07:55,980
We've got John Cowert
focusing on the execution

186
00:07:55,980 --> 00:07:58,450
of the milestones and
the day-to-day activities

187
00:07:58,450 --> 00:08:01,670
that SpaceX does to
execute those milestones,

188
00:08:01,670 --> 00:08:03,510
and then we've got another

deputy, Sheryl Malloy,

189
00:08:03,510 --> 00:08:06,300
to support - to focus on
the certification piece.

190
00:08:06,300 --> 00:08:10,920
And that's - in the 20-month,
21-month execution of iCap

191
00:08:10,920 --> 00:08:15,010
that certification is going
to be a key area of emphasis

192
00:08:15,010 --> 00:08:17,310
that we need to make a lot
of progress on in order

193
00:08:17,310 --> 00:08:19,770
to support the downstream
activities after iCap.

194
00:08:19,770 --> 00:08:21,620
>> Kyle: All right, and risk

195
00:08:21,620 --> 00:08:24,510
and certification
are two big key words

196
00:08:24,510 --> 00:08:27,050
in this program right now,
in fact, we're going to -

197
00:08:27,050 --> 00:08:28,350
Brent Jet [assumed
spelling] is going to stop by,

198
00:08:28,350 --> 00:08:31,220
he's the Deputy Manager of
the Commercial Crew Program,

199
00:08:31,220 --> 00:08:34,710
he's going to stop by, hopefully
tomorrow and fill us in probably

200
00:08:34,710 --> 00:08:36,290
in more detail on all of that

201
00:08:36,290 --> 00:08:40,110
because that obviously is a
big aspect of the next step

202
00:08:40,110 --> 00:08:44,990
in getting to a crew vehicle to
be able to travel to the station

203
00:08:44,990 --> 00:08:49,530
and support U.S. crew
rotation activities, right?

204
00:08:49,530 --> 00:08:50,310
>> Derek Hassman: Absolutely.

205
00:08:50,310 --> 00:08:52,320
And we're doing things
a little bit different

206
00:08:52,320 --> 00:08:57,210
with these Space Act agreements
in that we don't have the level

207
00:08:57,210 --> 00:09:00,470
of control or the level of
insight that we would have

208
00:09:00,470 --> 00:09:03,070
with a traditional contract.

209
00:09:03,070 --> 00:09:05,180

So what we need to
do in the context

210
00:09:05,180 --> 00:09:08,930
of the Space Act agreements
is to identify the key areas

211
00:09:08,930 --> 00:09:13,620
of risk, the key areas of risk
or perhaps potential challenges

212
00:09:13,620 --> 00:09:16,990
down the road where we want
to have the most NASA insight,

213
00:09:16,990 --> 00:09:20,600
as opposed to penetrating across
the board to the same level

214
00:09:20,600 --> 00:09:22,080
of detail in all the system.

215
00:09:22,080 --> 00:09:24,380
So it's very important to
identify risk and areas

216
00:09:24,380 --> 00:09:25,490
of open work, in areas

217
00:09:25,490 --> 00:09:29,030
of significant design
challenges, as we move forward.

218
00:09:29,030 --> 00:09:32,860
>> Kyle: You talked about the
early milestones in CCiCap,

219
00:09:32,860 --> 00:09:35,880
what are some of the others
that are - you've got it laid

220
00:09:35,880 --> 00:09:40,440
out across this 21-month period
of time that will lead to -

221
00:09:40,440 --> 00:09:43,960
I guess leads up to the point
of critical design review

222
00:09:43,960 --> 00:09:46,310
or right about there, right?

223
00:09:46,310 --> 00:09:49,600
>> Derek Hassman: Yes, the way
it's set-up SpaceX has a total

224
00:09:49,600 --> 00:09:51,230
of 14 milestones.

225
00:09:51,230 --> 00:09:54,630
The second to the last milestone
is a critical design review,

226
00:09:54,630 --> 00:09:58,630
and that's - that represents
a fairly mature design

227
00:09:58,630 --> 00:10:01,070
for the integrated system, for
the rocket and the spacecraft

228
00:10:01,070 --> 00:10:02,490
and all the ground systems.

229
00:10:02,490 --> 00:10:03,950
It's basically once you get

230
00:10:03,950 --> 00:10:07,080
to critical design review you're

ready to cut metal, so to speak,

231
00:10:07,080 --> 00:10:09,680
you start - you're ready
to build the configuration

232
00:10:09,680 --> 00:10:11,650
of the control spacecraft
and rocket,

233
00:10:11,650 --> 00:10:14,350
leading toward an
eventual launch.

234
00:10:14,350 --> 00:10:17,940
And between now and that
critical design review,

235
00:10:17,940 --> 00:10:21,650
there's another - a number
of other critical milestones.

236
00:10:21,650 --> 00:10:23,150
There's a safety review.

237
00:10:23,150 --> 00:10:26,060
There's a human certification
review, which SpaceX is going

238
00:10:26,060 --> 00:10:29,210
to tell us what they plan to
do to certify their system.

239
00:10:29,210 --> 00:10:33,840
And there's also two very, very
significant test activities

240
00:10:33,840 --> 00:10:35,720
that SpaceX plans to conduct.

241
00:10:35,720 --> 00:10:39,680
There's a pad abort test in
which SpaceX will demonstrate

242
00:10:39,680 --> 00:10:42,900
that the rocket and the launch
abort system - excuse me,

243
00:10:42,900 --> 00:10:46,290
the spacecraft with the
launch abort system is capable

244
00:10:46,290 --> 00:10:50,610
of safely taking the spacecraft
away from the pad in the case

245
00:10:50,610 --> 00:10:52,650
of some significant
issue with the rocket,

246
00:10:52,650 --> 00:10:55,200
and they will also conduct
an inflight abort test,

247
00:10:55,200 --> 00:10:59,480
where it'll be a flight-like
rocket, flight-like spacecraft

248
00:10:59,480 --> 00:11:00,820
with a launch abort system.

249
00:11:00,820 --> 00:11:03,770
They'll actually launch
the integrated vehicle,

250
00:11:03,770 --> 00:11:09,060
and then abort the spacecraft
in - as it's going up the hill

251

00:11:09,060 --> 00:11:12,100
and during ascent, so two
significant test activities

252
00:11:12,100 --> 00:11:15,410
that I'm certainly
looking forward to.

253
00:11:15,410 --> 00:11:16,840
>> Kyle: That's a
lot of work to do

254
00:11:16,840 --> 00:11:19,870
in 21 months the
way it's laid-out,

255
00:11:19,870 --> 00:11:24,580
and I think everybody recognizes
that it's going to be a lot

256
00:11:24,580 --> 00:11:28,190
of fun to follow along with
this and to be part of it.

257
00:11:28,190 --> 00:11:32,830
And, hopefully, we'll be able to
bring all of that to the viewers

258
00:11:32,830 --> 00:11:34,080
and the public out there.

259
00:11:34,080 --> 00:11:37,080
So, Derek Hassman, we really
appreciate you stopping

260
00:11:37,080 --> 00:11:41,350
by the console today to
update us on this latest steps

261
00:11:41,350 --> 00:11:43,540

in the Commercial Crew Program.

262
00:11:43,540 --> 00:11:46,800
Derek Hassman, the
Partner Manager for SpaceX,